INTEGRATED CIRCUIT DEVICES HAVING DIELECTRIC REGIONS PROTECTED WITH MULTI-LAYER INSULATION STRUCTURES AND METHODS OF FABRICATING SAME

Abstract of the Disclosure

A dielectric region, such as a ferroelectric dielectric region of an integrated circuit capacitor, is protected by a multi-layer insulation structure including a first relatively thin insulation layer, e.g.,. an aluminum oxide or other metal oxide layer, and a second, thicker insulating layer, e.g., a second aluminum oxide or other metal oxide layer. Before formation of the second insulation layer, the first insulation layer and the dielectric preferably annealed, which can increase a remnant polarization of the dielectric region. The first insulation layer can serve as a hydrogen diffusion barrier during formation of the second insulation layer and other overlying structures. In this manner, degradation of the dielectric can be reduced. Devices and fabrication methods are discussed.